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REPORT
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AGING AIRCRAFT SAFETY ACT OF 1991

APRIL 22, 1991.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. ROE, from the Committee on Public Works and Transportation, submitted the following

REPORT

[To accompany H.R. 172]

[Including cost estimate of the Congressional Budget Office]

The Committee on Public Works and Transportation, to whom was referred the bill (H.R. 172) to assure the continuing airworthiness of aging aircraft, and for other purposes, having considered the same, report favorably thereon with an amendment and recommend that the bill as amended do pass.

The amendment strikes out all after the enacting clause of the bill and inserts a new text which appears in italic type in the reported bill.

The reported bill directs the Administrator of the Federal Aviation Administration to initiate a rulemaking to require inspections of aircraft after 15 years of service to assure the continuing airworthiness of aging aircraft. The bill is needed to meet increasingly serious problems arising from aircraft being operated longer and beyond what was expected to be their "life" at the time of manufacture.

It has been recognized for many years that as aircraft get older they require increased attention and maintenance. However, the Aloha Airlines accident on April 28, 1988, which involved a structural failure on a relatively old and heavily used aircraft, shocked the Federal Aviation Administration, the aviation industry, and the traveling public. The accident challenged the soundness of a number of assumptions that had guided regulatory policy on aircraft age, structures, inspection, and maintenance.

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THE ALOHA AIRLINES ACCIDENT

On April 28, 1988, an Aloha Airlines Boeing 737 enroute from Hilo to Honolulu suffered a structural failure while flying at 24,000 feet. The failure caused an explosive decompression resulting in the separation and loss of approximately 18 feet of the skin and structure of the top of the aircraft. One flight attendant was swept out of the aircraft and is presumed to have perished. Eight other persons on the aircraft were seriously injured. The flight crew was able to make an emergency landing at Kahulai.

The National Transportation Safety Board determined that the probable cause of the accident was the failure of the airline to detect the presence of overlapping skin disbonding, metal fatigue, and separation in the aircraft's skin and structure. The NTSB also found, as contributing factors to the accident, the failure of the airline's management to properly supervise its maintenance work force; the failure of the FAA to evaluate properly the airline's maintenance program; the failure of the FAA to require certain inspections proposed by Boeing; and the lack of a required fix in a particular structural joint after the discovery of a problem.

INSPECTION AND MAINTENANCE OF OLDER AIRCRAFT

Aircraft age can obviously be measured by the passage of time, but more important is the number of flights or cycles. The Aloha Airlines aircraft involved in the 1988 accident was manufactured in 1969 and had 89,680 cycles at the time of the accident, making it one of the most highly used aircraft in the world.

As an aircraft goes through a flight, it is pressurized and depressurized, placing stress on the aircraft skin and structure. Over time, the repeated pressurization causes fatigue and cracking in the metal because the pressurization cycle causes expansion and contraction of the metal. If the cracks become too large in a critical location, the probability that a part or structure will fail increases, along with the possibility of an accident.

It has been long understood that as aircraft age and the number of cycles accumulate, cracks will increasingly develop and expand. The FAA and the industry have a good understanding of where cracks will develop after certain numbers of cycles on particular types of aircraft. And typically, the FAA and the industry have prescribed that aircraft should be inspected for cracks at certain locations after a certain number of cycles.

It was presumed that when a crack was found, its growth or propagation could be predicted, and if the crack were monitored, a repair could be delayed until the crack reached a certain size. When the crack reached that size, a repair would be required.

The Aloha accident demonstrated that the Achilles heel in this approach was the assumption that all potentially dangerous cracks can be discovered through inspections, as had been assumed prior to the accident. Because inspections, often visual, of hundreds or even thousands of individual rivets can be tedious, boring, and sometimes difficult to do, cracks can be missed. Also, little safety redundancy exists in an approach heavily reliant upon inspections if the inspections are done poorly and the cracks are not discovered.

Following the Aloha Airlines accident, the FAA and the industry concluded that a system to ensure the structural integrity of aircraft should not place so much reliance on inspections. The approach now in place (to be discussed in greater detail later) calls for repairs or modifications at certain intervals regardless of what inspections reveal. H.R. 172 would establish a special procedure outside the usual FAA/industry inspection process to verify that the new specified repairs and replacements have been accomplished on older aircraft.

AGE CHARACTERISTICS AND TRENDS IN THE AIRLINE FLEET

Concerns about the aging fleet have been further heightened by anticipated growth trends in the air transport industry. Passenger traffic is expected to grow from the current level of approximately 467 million passengers per year to 752 million in the year 2000. New aircraft production will not be able to keep pace with this growth, resulting in increasingly numerous aircraft being operated beyond their economic design life. Typically the economic design life of an aircraft is 20 years or 60,000 flights or cycles. (Economic design life describes how long an airline can expect to economically use a new aircraft from the time of purchase. The term does not describe the technical limitations of the aircraft.)

Presently, new aircraft being ordered today by the air transport industry cannot be delivered until approximately five years from now. Because of this, aircraft that at one time were expected to be retired are being kept in service, to provide capacity to meet growing passenger demand. New production aircraft entering the fleet are increasingly becoming additions to the fleet and not just replacements for older aircraft being retired. Also, absent further war in the Persian Gulf, relatively low fuel prices will make it economical to keep flying the older, less fuel efficient aircraft, rather than retire them.

The number of aircraft 20 years or older, and their proportion of the total fleet, will increase dramatically over the next 10 years. In 1988, the world jet transport fleet contained 2,440 aircraft 20 years or older or 28% of the total. It is projected by the FAA and the industry that in 1995, 4,100 aircraft, or 35% of the total, will be 20 years or older, and in the year 2000 more than 5,700 aircraft, or 40% of the fleet, will be this old.

Presently, the average age of the U.S. airline fleet is 12.7 years, with 20% of the fleet between 15 and 20 years and 26% older than 20 years. The average age of the U.S. fleet is expected to increase through the balance of the century.

FAA AND INDUSTRY ACTIONS SINCE THE ALOHA ACCIDENT

The most significant action since the Aloha accident has been the work of the government/industry Airworthiness Assurance Task Force that developed recommendations to the FAA that certain Service Bulletins issued by aircraft manufacturers prescribing repairs for specific structural problems be made mandatory through FAA Airworthiness Directives.

Service Bulletins are maintenance documents developed by aircraft manufacturers describing particular problems and how the

problems should be fixed. Service Bulletins are usually followed by aircraft operators, but aircraft operators are not required to do so by the FAA. When the FAA determines that a problem is significant enough to affect the safety of flight, an Airworthiness Directive is issued by the FAA and compliance with the relevant Service Bulletins becomes mandatory. If an Airworthiness Directive is not implemented, the aircraft cannot legally fly.

Typically, with respect to structural problems, Service Bulletins have provided two broad avenues for addressing problems. One avenue has been: After x number of cycles, begin inspecting for cracks in a particular location of the aircraft; if cracks are discovered, repair them after they reach a certain size. This approach typically requires repeated periodic inspections in order to be sure that the anticipated cracks would be discovered. As an alternative approach to inspections, Service Bulletins have also typically recommended that the inspections could be largely foregone if the parts or structures in question were repaired or replaced at a certain point. This is known as a "terminating action."

The Airworthiness Assurance Task Force reviewed all of the Service Bulletins pertaining to structural issues for the individual aircraft types and made recommendations that after a certain number of cycles or hours certain structural parts must be repaired or replaced regardless of whether cracks could be observed or not. In other words, terminating actions would become mandatory after a certain time or cycle interval, and the option of inspecting until cracks were discovered would be eliminated in a large number of situations.

The FAA has accepted the recommendations and is implementing them through its Airworthiness Directive process.

The cost of implementing the new Airworthiness Directives for Boeing aircraft has been estimated to average $600,000 per aircraft and $800 million for the fleet. The McDonnell Douglas aircraft repairs are expected to average $269,000 per aircraft and total $563 million for that fleet. Many of the modifications have already been made, and others will come later as individual aircraft reach specified numbers of cycles over the next few years.

Beyond the work of the Airworthiness Assurance Task Force, other government/industry task forces have also been established on future research and development on aging aircraft, improved government/industry communications, and human factors in maintenance.

The Committee has been informed that the FAA will continue the work of the Airworthiness Assurance Task Force by making this joint industry/government aging aircraft working group a permanent subcommittee of the FAA's Research and Development Advisory Committee, and in the future, a permanent subcommittee of the FAA's Regulatory Advisory Committee. The Committee strongly endorses this plan and commends the FAA for its foresight in maintaining this organization which has been instrumental in addressing the problems of the aging of the commercial jet aircraft fleet.

THE NEED FOR THE LEGISLATION

Maintenance on aging aircraft will become an increasingly important aspect of air carriers' maintenance programs as relatively few aircraft will be retired over the next several years and as aircraft are increasingly operated longer than was anticipated at the time of their manufacture. Prudence dictates that our legal and regulatory philosophy and framework recognize this and be adjusted to take account of these trends and developments. Recent industry and agency actions reflect that the problems associated with the aging fleet require much more than business-as-usual solutions. The aviation laws of the country should reflect this trend as well by legally established special inspections and procedures to address the aging aircraft problems.

A second reason for the legislation stems from the complex web of ownership and leasing relationships and aircraft financial transactions prevalent in the world's airline industry today, resulting in some aircraft changing hands among operators with relative frequency. The General Accounting Office submitted testimony to the Subcommittee on Aviation that some aircraft have changed hands as many as 18 times since 1981, usually crossing international borders each time. The specter of aircraft maintenance work being deferred to the next owner or lessee in order to save money is very real. This bill will ensure that from an FAA perspective, necessary work is accomplished on a timely basis and is not deferred from owner to owner.

Third, in spite of all that the industry and FAA have done to address the aging aircraft problem, the Committee's sense is that most of it has been lost on the traveling public, because of the complexity and arcaneness of the current system of safety assurance. The public should not be expected to sort our Airworthiness Directives, Service Bulletins, Economic Design Life, and other technical terms and concepts in determining their comfort level with flying. Since the traveling public is very concerned about the safety of older aircraft, we need a comprehensive system of safety assurance that does not require in-depth aviation regulatory knowledge. Under the legislation, an inspection will be required in which a straightforward question will be asked: "Is this airplane safe?" Under the legislation, the answer to that question will be equally as straightforward: "yes" or "no." Aircraft will not be permitted to return to service until the answer is "yes." The traveling public should take strong assurance from this legislation that we are doing all that needs to be done to ensure the safety of older aircraft.

ENCOURAGEMENT OF FOREIGN AND INTERNATIONAL ACTIONS

Finally, the reported bill also directs the FAA Administrator to take all possible steps to encourage foreign governments and relevant international organizations to develop standards for inspections of aging aircraft similar to those required by this bill.

In an aviation world that is increasingly global in nature, it is important that the legal and regulatory steps we implement in this country be emulated elsewhere. One aspect of airline globalization is that citizens of the United States are flying, not just on U.S. car-

riers, but foreign carriers as well. They should be afforded the same level of safety they have come to expect when flying on U.S. carriers.

It is also important for competitive marketplace reasons that foreign carriers be subjected to similar regulatory requirements as we impose on U.S. carriers. It would put U.S. carriers at a competitive disadvantage to impose this additional regulatory burden without seeking to impose similar burdens on foreign competitors.

The Committee expects the FAA Administrator to use his good offices aggressively to convince other governments of their importance of these inspections. To ensure that he do so, a report to Congress is required on his actions in this regard.

SECTION-BY-SECTION DESCRIPTION

Section 1 provides a short title, the "Aging Aircraft Safety Act of 1991."

Section 2(a) directs the FAA Administrator to initiate a rulemaking, not later than 180 days after enactment, to assure the continuing airworthiness of aging aircraft.

Section 2(b)(1) requires the Administrator, pursuant to the rule, to make inspections and reviews of each aircraft's records to permit a determination that the aircraft is in safe condition and properly maintained.

Section 2(b)(2) provides that these inspections shall be carried out as part of an aircraft's heavy maintenance checks after 15 years of service. If the Administrator determines in the rulemaking that these inspections should take place during a heavy maintenance check prior to the fifteenth year, the Administrator should use his authority to implement these inspections at an earlier time.

In implementing the legislation, the Committee believes that the FAA should exercise reasonable discretion in implementing the rules prescribed by the legislation. For instance, given the relative infrequency of some air taxi operations, the on-demand air taxi industry may well require the application of regulatory concepts and time frames other than those prescribed for large aircraft operators. In exercising its discretion, the FAA should act in a manner which will maintain an equivalent level of safety for the traveling public among the different classes of operators.

Section (2)(b)(3) provides that these inspections shall be conducted as are other inspections under existing law, specifically pursuant to Section 601(a)(3)(c) of the Federal Aviation Act, which provides that the Administrator shall establish the manner in which inspections shall be conducted, including at the Administrator's discretion, inspections and reports by properly qualified private persons.

Section 2(c) requires the air carrier to demonstrate that aging aircraft maintenance has been adequate and timely enough to ensure the highest degree of safety.

Section 2(d) provides that the rule should establish the procedures to be followed in conducting the required inspections.

Section 2(e) requires air carriers to make aircraft and records available for the required inspections. With respect to Section 2(e) and the availability of aircraft, the Committee's intent is consistent with other sections of the legislation which specify that FAA in-

spections are to be part of, and not separate from, other review procedures. The inspections and reviews required by Section 2(b)(2) are to be coordinated with the air carrier, so that the aircraft and records are available to the Administrator during the heavy maintenance check scheduled by the air carrier for that aircraft.

The Committee is aware that the FAA has completed a prototype fleet evaluation program that was well coordinated with the air carriers and efficiently conducted during normal heavy maintenance checks of twenty-three transport aircraft. The purpose of the evaluation program was to verify the effectiveness of the air carriers' maintenance programs in carrying out aging aircraft guidelines. A similar evaluation program is currently being undertaken on the commuter aircraft fleet.

The FAA has compiled a report of the results of these evaluations, which has been published in a document and made available to airline management and FAA personnel for use in evaluating and adjusting airline maintenance and training programs. The Committee believes that the FAA and the air carrier industry should continue these cooperative efforts to enhance safety.

Additional aircraft inspections will be conducted on an annual basis as a follow-up, and the FAA is incorporating the aging transport fleet evaluations into the National Aviation Safety Inspection Program (NASIP). The NASIP will ensure adequate analysis of ongoing findings and correction of system defects.

Section 3 directs the Administrator to establish three aircraft maintenance safety programs.

(1) A program to verify that air carriers are maintaining their aircraft in accordance with programs approved by FAA.

(2) A program to provide training and enhanced participation of FAA inspectors and engineers in conducting corrosion and metal fatigue inspections.

(3) A program to ensure that air carriers demonstrate their commitment and technical competence to assure the airworthiness of their aircraft.

Section 4(a) directs the Administrator to take all possible steps to encourage foreign and international organizations to develop standards and requirements for inspections and reviews which will ensure the continuing airworthiness of aging aircraft used by foreign air carriers to provide foreign air transportation to and from the United States and which will afford passengers of such foreign air carriers the same level of safety as will be afforded passengers of air carriers by implementation of this Act.

Section 4(b) requires that the Administrator to submit a report to Congress not later than the last day of second fiscal year beginning after enactment on implementation of this section.

Section 5 provides a definition of "Administrator."

COMMITTEE ACTION AND VOTE

With respect to clause 2(l)(2) (A) and (B) of rule XI of the Rules of the House of Representatives, the Committee, with a majority present, favorably reported H.R. 172, as amended, by a voice vote on April 16, 1991. In the 101st Congress, the House of Representatives passed, under Suspension of the Rules on July 16, 1990, the

Aging Aircraft Safety Act (H.R. 3774), by a voice vote. Prior to the House's action in the 101st Congress, the Subcommittee on Aviation held hearings on assuring the safety of the aging aircraft fleet on September 27 and October 10, 1989 (Committee Publication 101–25). On May 1, 1990, the Subcommittee on Aviation held hearings on the Aging Aircraft Safety Act (Committee Publication 101–49). On June 29, 1990, the Subcommittee favorably reported the bill, as amended, and on June 27, 1990, the Committee reported the bill, as amended, by voice vote to the House. (House Report 101–606)

OVERSIGHT FINDINGS AND RECOMMENDATIONS

With respect to clause 2(l)(3)(A) of rule XI of the Rules of the House of Representatives, the Committee reports that the Subcommittee on Investigations and Oversight has held no hearings on the subject of H.R. 172, as amended.

With respect to clause 2(l)(3)(D) of rule XI of the Rules of the House of Representatives, the Committee has not received a report from the Committee on Government Operations pertaining to the subject matter of H.R. 172, as amended.

CONGRESSIONAL BUDGET ACT REQUIREMENTS

With respect to clause 2(l)(3)(B) of rule XI of the Rules of the House of Representatives and section 308(a) of the Congressional Budget Act of 1974, a "308(a)" report is not required because H.R. 172, as amended, does not provide new budget authority or new or increased tax expenditures.

With respect to clause 2(l)(3)(C) of rule XI of the Rules of the House of Representatives and section 403 of the Congressional Budget Act of 1974, the following report has been received from Congressional Budget Office regarding H.R. 172, as amended.

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, April 19, 1991.

Hon. ROBERT A. ROE,
Chairman, Committee on Public Works and Transportation, House of Representatives, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has reviewed H.R. 172, the Aging Aircraft Safety Act of 1991, as ordered reported by the House Committee on Public Works and Transportation, April 16, 1991. CBO estimates that enactment of the bill would cost the federal government about $1 million over the next two-to-three years, assuming appropriation of the necessary funds. H.R. 172 would not affect direct spending or receipts and there would therefore be no pay-as-you-go scoring.

H.R. 172 would require that, not later than 180 days after enactment, the Administrator of the Federal Aviation Administration (FAA) initiate a proceeding for the purpose of issuign a rule to assure the continuing airworthiness of aging aircraft. The bill also would require that, not later than 180 days after enactment, the Administrator establish a program to verify that air carriers are properly maintaining their aircraft and to provide FAA inspectors and engineers with training necessary to codnuct auditing inspec-

tions of aircraft. In addition, H.R. 172 would require that the Administrator encourage foreign governments and relevant international organizations to develop standards and requirements to ensure the continuing airworthiness of aging aircraft used by foreign air carriers to provide air transportation to and from the United States.

Based on information provided by the FAA, CBO estimates that the agency would have to spend about $1 million over the next two-to-three years to carry out the bill's requirements, primarily to train FAA inspectors and engineers to conduct auditing inspections of aircraft.

No costs would be incurred by state or local governments as a result of enactment of this bill.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Mitchell Rosenfeld, who can be reached at 226–2860.

Sincerely,

ROBERT F. HALE
(For Robert D. Reischauer).

INFLATIONARY IMPACT ANALYSIS

With respect to clause 2(l)(4) of rule XI of the Rules of the House of Representatives, the Committee reports that there should be no inflationary impact on prices and costs in the operation of the national economy by enactment of H.R. 172, as amended.

COST ESTIMATES OF THE LEGISLATION

With respect to clause 7(A)(2) of rule XIII the Rules of the House of Representatives, the Committee concurs in the above cost estimate of H.R. 172, as amended, submitted by Congressional Budget Office.

With respect to clause 7(A)(1) of rule XIII of the Rules of the House of Representatives, the Committee reports that no cost estimate of H.R. 172, as amended, was submitted to the Committee by a Government agency.

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